DO NOT OPEN THIS TEST BOOKLET TILL YOU ARE ASKED TO DO SO

TR/DLTI/CIV/P-II/17

Test Booklet Series

A

TEST BOOKLET
GENERAL ABILITY TEST
(PART– II)
(Civil Engineering)

(Signature of the Candidate)

(Invigilator's Signature)

Time Allowed : 1 hour 30 minutes (One hour thirty minutes) **Maximum Marks : 60**

INSTRUCTIONS

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE SCREENING TEST, YOU SHOULD CHECK THAT THIS TEST BOOKLET DOES NOT HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.
2. **ENCODE CLEARLY THE TEST BOOKLET SERIES IN THE APPROPRIATE PLACE IN THE ANSWER SHEET BY BLACK BALL POINT PEN ONLY.**
3. This Test Booklet contains 60 items (questions). Each question, carrying 1 (one) mark only, has four responses (answers). You will select the response which you want to mark on the Answer Sheet. In case you feel that there is more than one correct response, mark the response which you consider the most appropriate. In any case, choose ONLY ONE response for each item.
4. You have to mark all your responses by **Black Ball Point Pen only** on the separate Answer Sheet provided. See directions in the Answer Sheet.
5. All items carry equal marks.
6. Before you proceed to mark in the Answer Sheet the responses to various items in the Test Booklet, you have to fill in some particulars in the Answer Sheet.
7. After you have completed filling in responses on the Answer Sheet and the Screening Test is completed, you should handover the Answer Sheet to the Invigilator only. You are permitted to take the Test Booklet with you.
8. Sheets for rough work are appended on the Test Booklet at the end.
9. **Penalty for wrong answers :**
   (a) There will be four alternatives for the answer to every question. For each question for which a wrong answer has been given by the candidate, **one-third** of the marks assigned to that question will be deducted as penalty.
   (b) If a candidate gives more than one answer, it will be treated as a **Wrong Answer** even if one of the given answers happens to be correct and there will be same penalty as above to that question.
   (c) If a question is left blank, i.e. no answer is given by the candidate, there will be **no penalty** for that question.

DO NOT OPEN THIS TEST BOOKLET TILL YOU ARE ASKED TO DO SO

01.09.2017

Four options are given against each of the following questions. Select the best/correct option from among the four options and encode in the answer sheet by using **Black Ball Point Pen** only as per example given below :

Example : The capital of India is

(A) Delhi ● New Delhi

(C) Indraprastha (D) None of these

1. Weight of a dry brick is W_1 while weight of the brick soaked in water is W_2. Water absorption by weight will be

(A) $\frac{W_2 - W_1}{W_2} \times 100$

(B) $\frac{W_2 - W_1}{W_1} \times 100$

(C) $\frac{W_2 - W_1}{W_2 + W_1}$

(D) $\frac{W_2 + W_1}{W_2 - W_1} \times 100$

2. Refractory bricks are used for

(A) Foundation

(B) Load bearing walls

(C) Gravity dams

(D) Furnace lining

3. Initial setting time for Rapid Hardening cement is

(A) 25 minutes

(B) 30 minutes

(C) 40 minutes

(D) 45 minutes

4. One of the common preservatives used to prevent decay and deterioration of timber is

(A) zinc chloride

(B) calcium chloride

(C) sodium chloride

(D) potassium chloride

5. When P is safe bearing pressure on base in N/m^2, 'w' is unit weight of soil in N/m^3 and ϕ is the angle of repose of soil in degrees, then the minimum depth of foundation in metres according to Rankine's formula is

(A) $\frac{P}{w}\left(\frac{1-\sin\phi}{1+\sin\phi}\right)^2$

(B) $\frac{P}{w}\left(\frac{1+\sin\phi}{1-\sin\phi}\right)^2$

(C) $\frac{P}{w}\left(\frac{1-\sin\phi}{1+\cos\phi}\right)^2$

(D) $\frac{P}{w}\left(\frac{1+\sin\phi}{1-\cos\phi}\right)^2$

6. Differential settlement of foundations takes place due to

(A) Non-uniformity of pressure distribution

(B) Low water table

(C) Unequal expansion of soil

(D) All of the above

7. Foundation having two tiers of steel beams, the top layer being placed at right angle to the bottom layer and the two layers being separated by spacers are known as

(A) Caisson foundation

(B) Grillage foundation

(C) Frankie foundation

(D) Raft foundation

8. 'Frog' is a term associated with

(A) Log of timber

(B) Stone boulders

(C) Steel plates

(D) Bricks

01.09.2017

9. Headers and stretchers are laid alternately in the same course in

(A) English bond

(B) Single Flemish bond

(C) English cross bond

(D) Herring bond

T T P S C

10. Which one of the following is not a type of staircase ?

(A) Open well

(B) Dog legged

(C) Baluster

(D) Straight flight

11. Temporary support to any damaged structure under repairs, remodelling or alteration is known as

(A) Shoring

(B) Under pinning

(C) Scaffolding

(D) None of these

12. One commonly used formula for determining load carrying capacity of piles is

(A) Kennedy's formula

(B) Lacey's formula

(C) Rankine formula

(D) Engineering News formula

13. Sheet piles are used

(A) As load bearing member

(B) As test piles

(C) For holding forces of excavation for coffer dams

(D) When horizontal component of the piles is comparatively large

14. When V_v is the volume of voids and V is the total volume of a given soil mass, porosity is given by

(A) $\frac{V - V_v}{V}$

(B) $\frac{V_v}{V}$

(C) $\frac{V_v}{V - V_v}$

(D) $\frac{V}{V + V_v}$

15. Relation among Plasticity Index (I_P), Liquid Limit (W_L) and Plastic Limit (W_P) of a soil is

(A) $I_P = \frac{W_L - W_P}{W_L}$

(B) $I_P = \frac{W_P - W_L}{W_P}$

(C) $I_P = W_L - W_P$

(D) $I_P = W_P - W_L$

TPSC
OLD QUS PAPER
NOT FOR SALE
01.09.2017

16. The water content, corresponding to the stage when total volume of a saturated soil sample will not be further reduced on drying up, is termed

(A) Shrinkage limit

(B) Consistency limit

(C) Flow index

(D) Toughness index

17. For compaction of soil, one type of ramming equipment is

(A) Pulsating hydraulic type

(B) Smooth wheel rollers

(C) Sheep food rollers

(D) Dropping weight type

18. Unconfined compression test is resorted to in the laboratory for determining the

(A) Permeability

(B) Shearing resistance

(C) Shrinkage limit

(D) Sensitivity

19. A body of soil is said to be in plastic equilibrium if every point of it is on the verge of

(A) Full consolidation

(B) Failure

(C) Partly saturation

(D) Attaining stability

20. For a dry backfill with no surcharge, the total active earth pressure on a retaining wall of height 'H' is given by

(A) $\frac{1}{3} K_a \gamma H^2$

(B) $\frac{1}{2} K_a \gamma H^2$

(C) $\frac{2}{3} K_a \gamma H^2$

(D) $\frac{1}{3} K_a \gamma H^2$

[K_a= Coefficient of active earth pressure,

γ = Dry weight of soil]

21. A gravity retaining wall resists the lateral earth pressure by

(A) its weight

(B) bending action

(C) its repulsive action

(D) chemical action with earth

01.09.2017

22. IS code of practice for Earthquake Resistant Design and Construction of Buildings (2nd revision) is

(A) IS 875 – 1987

(B) IS 5329 – 1983

(C) IS 4928 – 1993

(D) IS 800 – 1984

T P S C

23. The full form of 'CBR' in 'CBR method for the design of flexible pavementgs' is

(A) Californian Bearing Ratio

(B) California Bearing Ratio

(C) California Boring Ratio

(D) California Burnister's Ratio

24. The ratio of the area of a jet at vena-contracta to the area of the orifice is called the coefficient of

(A) friction

(B) discharge

(C) discharge contraction

(D) contraction

25. The stream of water discharged by an orifice is termed a

(A) Jet

(B) Vein

(C) Nappe

(D) Free Nappe

26. Of the following, all are various types of weirs except

(A) Suppressed

(B) Oblique

(C) Sharp crested

(D) Broad crested

27. The actual mean velocity in a channel cross-section may be determined from the following except

(A) Kutter's formula

(B) Manning's formula

(C) Francis formula

(D) Chezy's formula

28. For a rectangular channel, the condition required to be fulfilled in order to have maximum discharge, cross-sectional area remaining constant, is

(A) Depth is half the breadth

(B) Breadth is half the depth

(C) Depth is equal to breadth

(D) Depth should be more than breadth

29. When a body is subjected to tensile on compressive load, Poisson's ratio is equal to

(A) $\frac{\text{Primary strain}}{\text{Lateral strain}}$

(B) $\frac{\text{Lateral strain}}{\text{Primary strain}}$

(C) $\frac{\text{Strain}}{\text{Stress}}$

(D) $\frac{\text{Shear stress}}{\text{Shear strain}}$

T P S C
OLD QUS PAPER
NOT FOR SALE
T P S C
01.09.2017

30. For a material, modulus of elasticity is E, modulus of rigidity is N and bulk modulus is K. Relation between E, N and K is

(A) $E = \frac{6\,KN}{N + 3K}$

(B) $E = \frac{6\,KN}{N + 3K}$

(C) $E = \frac{9\,KN}{3N + K}$

(D) $E = \frac{9\,KN}{N + 3K}$

31. The highest unit stress upto which the material follows Hooke's law is known as

(A) Working stress

(B) Ultimate stress

(C) Elastic limit

(D) Modulus of elasticity

37. A slab supported on columns only, with or without flared heads, is known as

(A) Ribbed slab

(B) Flat slab

(C) One way slab

(D) Cantilever slab

38. For a footing (effective depth - d) of a square column of section $b \times b$, the punching shear is calculated over an area

(A) 4 (b+d)

(B) 2 (b+d)

(C) $2b \times d$

(D) $4b \times d$

39. Without shear reinforcement, RCC beams fail in the following ways except one which is

(A) Diagonal tension failure

(B) Flexural shear failure

(C) Punching shear failure

(D) Compression failure at diagonals

40. One of the four options given below is not a type of shear reinforcement. Please identify the same.

(A) Vertical stirrups

(B) Transverse reinforcement

(C) Bent up bars

(D) Inclined stirrups

41. One assumption which is not made in Ultimate load Design method is

(A) Plane section normal to the axis remains plane after bending

(B) Maximum fibre stress in concrete does not exceed 0.68 σ_{cu} (σ_{cu} = ultimate strength of concrete cube of 28 days)

(C) Tensile strength of concrete is not neglected

(D) None of these

01.09.2017

42. Full form of BOD is

(A) Biochemical Oxygen Demand

(B) Biological Oxygen Demand

(C) Bio-technical Oxygen Demand

(D) Bio Oxygen Demand

43. One of the following processes which is not used for softening hard water is

(A) Lime process

(B) Lime and soda ash process

(C) Coagulation process

(D) Base exchange process

44. Statement which is not applicable for prestressed concrete is

(A) The structure is crack free

(B) It is economical for both small and large projects

(C) Requirement of cement and steel are less compared to RCC structure

(D) Load carrying capacity is more than similar RCC structure

45. All the methods except one as mentioned below are various methods adopted in prestressing. Mark the exception.

(A) Pretensioning

(B) Post tensioning

(C) Circular prestressing

(D) Internal prestressing

46. A prestressed concrete beam section can fail at ultimate load in the following ways except

(A) Fracture of concrete in tension

(B) Failure of bond in pretensioned system

(C) Failure of anchorage in pretensioned system

(D) Small elongation of steel followed by crushing of concrete

47. Of the following, the incorrect statement is

(A) Limit state means an acceptable limit for the safety and serviceability requirements before failure can occur

(B) "Tensile strength of concrete is not ignored"— is one of the assumptions of design for limit state of collapse in flexure.

(C) Limit state method combines the principles of ultimate load theory and elastic theory.

(D) In the limit state method, a structure is designed to withstand all loads likely to act on it during its life span.

48. The convexity provided to the carriage way between crown and edge of pavement is known as

(A) Super elevation

(B) Gradient

(C) Camber

(D) Circular curve

01.09.2017

49. Compound curve, a type of circular curves used in highway, is a curve of

(A) Two radii

(B) Three radii

(C) Single radius

(D) None of these

50. Rocker bearings are one of the common types of bearings used in bridges. The bottom shoe of a Rocker bearing rests on

(A) Cylindrical rollers

(B) Curved bed plate

(C) Sole plate

(D) Honeycombed bed plate

51. Causeways are normally not constructed when

(A) The floods are of short duration

(B) The floods are of long duration

(C) Water course are shallow

(D) Maximum discharge is not heavy

52. When B is the base period in days and Δ is the total depth of water in metre, then Duty is given by

(A) $\frac{8.64\,\Delta}{B}$

(B) $\frac{8.64\,B}{\Delta}$

(C) $\frac{12.64\,\Delta}{B}$

(D) $\frac{12.64\,B}{\Delta}$

53. An irrigation canal is required to cross a natural drain. A cross-drainage structure is constructed where the drain is taken over the canal. This type of cross-drainage structure is named

(A) Aqueduct

(B) Syphon aqueduct

(C) Super passage

(D) Inlet and outlet

54. Of the statements a, b, c and d given below, the incorrect one is

(A) In structural steel works, only butt welds are used.

(B) Welded structures are usually lighter than riveted ones.

(C) Rivets completely fill the holes.

(D) Friction between the rivet and plate is neglected.

01.09.2017

55. PERT is the acronym of

(A) Programme Estimation and Review Technique

(B) Programme Enumeration and Review Technique

(C) Programme Evaluation and Review Technique

(D) Policy Evaluation and Review Technique

56. The Guuter's Chain, divided into 100 links, is

(A) 33 ft long

(B) 50 ft long

(C) 60 ft long

(D) 66 ft long

57. Of the following, the survey instrument not required for chain survey is

(A) Cross staff

(B) Alidade

(C) A chain

(D) A plumb bob

58. Staff reading on a point whose elevation is to be determined as on a change point, is known as

(A) Foresight

(B) Backsight

(C) Intermediate sight

(D) Height of instrument

59. The observed reading on a staff held at a point 'A' is 4m. The staff is found to be 20 cm off the vertical through its bottom. The correct staff reading on 'A' should be

(A) 3.794 m

(B) 3.894 m

(C) 3.994 m

(D) 3.984 m

60. From the following statements, pick the correct one :

(A) In a Bar Chart, each item of work can not be shown separately.

(B) Dummy Activity is a fictitious activity with no cost and no duration.

(C) Late Finish Time is the latest time that the event can take place without delaying the project.

(D) In Critical Path Method, idle periods are not eliminated.

01.09.2017